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Phase diagram, depinning and sliding friction in the Phase Field Crystal model TAPIO ALA-NISSILA, CRISTIAN VASILE ACHIM, Helsinki University of Technology, Laboratory of Physics, Espoo, Finland, KEN R. ELDER, Oakland University, Department of Physics, Rochester, United States, MIKKO KARTTUNEN, The University of Western Ontario, Departament Of Applied Mathematics, London, Canada, ENZO GRANATO, Instituto Nacional de Pesquisas Espaciais, Laboratório Associado de Sensores e Materiais, São José dos Campos, Brazil, SEE CHEN YING, Brown University, Departament of Physics, Providence, United States
— We present results for commensurate-incommensurate transitions and non-linear sliding friction for a two-dimensional crystal lattice in the presence of an external pinning potential in the Phase Field Crystal model. This model provides a continuum description of lattice system, such as adsorbed monolayers or two-dimensional vortex lattice. The competition between the length scales associated with the intrinsic ordering and the pinning potential leads to commensurate-incommensurate transitions. The dynamical response of the system in the presence of a driving force has also been studied via the time dependent Ginzburg-Landau equation. We present results on non-linear dynamics and sliding mechanisms for commensurate phases.

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